UNIT-4 (Scientific Computing with Python: Scipy)

MCA - III Semester

Subject: Data Science & Analytics using Python

Unit-IV Assignment

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Part-A **10X1=10**

Q.1 (CO4) SciPy stands for?

A. science Python

B. source Python

C. significant Python

D. scientific Python

Q.2 (CO4) SciPy Original author is?

A. Guido van Rossum

B. Travis Oliphant

C. Wes McKinney

D. Jim Hugunin

Q.3 (CO4) Which of the following is not correct sub-packages of SciPy?

A. scipy.cluster

B. scipy.source

C. scipy.interpolate

D. scipy.signal

Q.4 (CO4) The number of axes is called as _____.

A. object

B. Vectors

C. rank

D. matrices

Q.5 (CO4) Which of the following is true?

A. By default, all the NumPy functions have been available through the SciPy namespace

B. There is no need to import the NumPy functions explicitly, when SciPy is imported.

C. SciPy is built on top of NumPy arrays

D. All of the above

Q.6 (CO4) What will be output for the following code?

```
import numpy as np
print np.arange(7)
```

A. array([0, 1, 2, 3, 4, 5, 6])

B. array(0, 1, 2, 3, 4, 5, 6)

C. [0, 1, 2, 3, 4, 5, 6]

D. [[0, 1, 2, 3, 4, 5, 6]]

Q.7 (CO4) What will be output for the following code?

```
import numpy as np
print np.linspace(1., 4., 6)
```

A. array([1. , 2.2, 2.8, 3.4, 4.])

B. array([1. , 1.6, 2.8, 3.4, 4.])

C. array([1. , 1.6, 2.2, 2.8, 3.4, 4.])

D. array([1. , 1.6, 2.2, 2.8, 4.])

Q.8 (CO4) Which of the following code is used to whiten the data?

A. data = numpy.whiten(data)

B. data = whiten(data)

C. data =SciPy.whiten(data)

D. data = data.whiten()

Q.9 (CO4) How to import Constants Package in SciPy?

A. import scipy.constants

B. from scipy.constants

C. import scipy.constants.package

D. from scipy.constants.package

Q.10 (CO4) What is "h" stand for Constant?

A. Newton's gravitational constant

B. Elementary charge

C. Planck constant

D. Molar gas constant

Q.11 (CO4) what is constant defined for Boltzmann constant in SciPy?

A. G

B. e

C. R

D. k

Q.12 (CO4) What is the value of unit milli in SciPy?

A. 0.01

B. 0.1

C. 0.0001

D. 0.001

Q.13 (CO4) What will be output for the following code?

```
from scipy import linalg
import numpy as np
a = np.array([[3, 2, 0], [1, -1, 0], [0, 5, 1]])
b = np.array([2, 4, -1])
x = linalg.solve(a, b)
print x
```

A. array([2., -2., 9., 6.])

B. array([2., -2., 9.])

C. array([2., -2.])

D. array([2., -2., 9., -9.])

Q.14 (CO4) What will be output for the following code?

```
from scipy import linalg
import numpy as np
A = np.array([[1,2],[3,4]])
x = linalg.det(A)
print x
```

A. 2

B. 1

C. -2

D. -1

Q.15 (CO4). In SciPy, determinant is computed using?

A. determinant()

B. SciPy.determinant()

C. det()

D. SciPy.det()

Q.16 (CO4). scipy.linalg always compiled with?

A. BLAS/LAPACK support

B. BLAS/Linalg support

C. Linalg/LAPACK support

D. None of the above

Q.17 (CO4) Which of the following is false?

A. scipy.linalg also has some other advanced functions that are not in numpy.linalg

B. SciPy version might be faster depending on how NumPy was installed.

C. Both A and B

D. None of the above

Q.18 (CO4) The scipy.linalg.solve feature solves the _____.

A. integration problem

B. differentiation problem

C. linear equation

D. All of the above

Q.19 (CO4) What relation is consider between Eigen value (lambda), square matrix (A) and Eign vector(v)?

A. Av = lambda*v

B. Av =Constant * lambda*v

C. Av =10 * lambda*v

D. Av != lambda*v

Q.20 (CO4) What will be output for the following code?

```
from scipy.special import logsumexp

import numpy as np
```

a = np.arange(10)

res = logsumexp(a)

print res

A. 10

B. 9.45862974443

C. 9

D. 9.46

Part-B **5X2=10**

Q.1 (CO4) What is the concept of Packages in Scipy in Python?

Q.2 (CO4) What do you understand by optimization in reference of scipy library in Python?

Q.3 (CO4) Write the name of different types of sub packages in scipy library of python?

Q.4(CO4) Write the statement for importing the scipy library in python?

Q5 (CO4) What do you understand by Scipy library of python?

Part-C **5X6=30**

Q.1 (CO4) Briefly discuss basis of statistics sub package of scipy in python with example.

Q.2 (CO4) Describe concept of Integration sub package and its types in scipy with example.

Q.3 (CO4) What do you understand by need and use of weave sub package of scipy in python with example

Q.4.(CO4) Describe the concept of Optimization sub package with example used in python.

Q.5.(CO4) Describe the concept of IO sub package with example used in python.

Part-D **2X10=20**

Q.1 (CO4) Create a code in python using scipy library to optimize a Minimize equation as given below

Objective function: x1*1+x1*x2

Constraints: x1*x1*x1+x1*x2=100

X1*x1*x1+x1*x2>=50

-100<=x1*x2<=100

Q.2 (CO4) Solve the given Linear equation using scipy of python

X+2y-3z=-3

2x-5y+4zz=13

$5x+4y-z=5$